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## (54) SILICONE RUBBER COMPOSITION FOR WIPER BLADE

### (57)Abstract:

PURPOSE: To obtain the subject silicone rubber composition of good weathering resistance by using an organopolysiloxane green rubber, wet-process silica, kieselguhr, powder of laterally cleaving mineral and organic peroxide.

CONSTITUTION: The subject composition free from chattering and squeaking comprises (A) 100 pts.wt. of organopolysiloxane green rubber, (B) 10 to 50 pts.wt. of wet-process silica, (C) 10 to 50 pts.wt. of kieselguhr preferably of 5 to 40 $\mu$ m average particle size, (D) 0 to 50 pts.wt. of a laterally cleaving mineral, preferably a mica powder, (E) 0 to 10 pts.wt. of fluororesin powder such as polytetrafluoroethylene resin powder and (F) an organic peroxide such as benzoyl peroxide.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the optimal detailed heat-hardening type silicone rubber constituent for a wiper blade about the silicone rubber constituent for wiper blades.

[0002]

[Description of the Prior Art] Conventionally, synthetic rubber, such as chloroprene rubber, styrene butadiene rubber, and an ethylene propylene rubber, has been used for the wiper blade for vehicles. However, this kind of rubber for wiper blades is inferior to weatherability and abrasion resistance, and is between wiper-blade rubber and a glass side especially at the time of half-dryness or \*\*\*\*. An agglutination phenomenon happens, the self-excited vibration by the speed dependency of "the so-called lock phenomenon" and so-called coefficient of friction which the operation of a wiper stops showing the negative characteristic, and the so-called "chatter phenomenon" occur, and life shortening of each part of connection of unusual friction of poor eradication and a blade rubber front face and a wiper system takes place. moreover, a "chatter phenomenon" and " -- it cries and is based on " -- there was which jarring trouble that it was offensive to the eye

[0003]

[Problem(s) to be Solved by the Invention] This invention persons reached this invention, as a result of inquiring in order to cancel this conventional trouble. namely, the purpose of this invention -- weatherability -- excelling -- especially -- a "chatter phenomenon" and " -- it is in offering the silicone rubber constituent for wiper blades which it cries and "does not generate

[0004]

[Means for Solving the Problem and its Function] this invention (A) organopolysiloxane crude rubber The 100 weight sections, (B) wet silica 10 - 50 weight section, the (C) silicious marl 10 - 50 weight section, (D) parallel cleavage mineral powder 0 - 50 weight section, (E) fluororesin powder 0 - 10 weight section, (F) organic peroxide It is related with the silicone rubber constituent for wiper blades which consists of the 0.1 - 10 weight section.

[0005] When this invention is explained in detail, the (A) component used for this invention is organopolysiloxane crude rubber used as the main raw material of the silicone rubber of a millable type, and is the shape of a straight chain and the chain-like organopolysiloxane which branched a little of the amount of macromolecules which presents the shape of gum in ordinary temperature. Although a methyl group, an ethyl group, a vinyl group, a phenyl group, 3 and 3, and 3-truffe RUORO propyl group are illustrated as a side-chain organic machine, at least 50-mol % is a methyl group preferably. That by which a part of methyl group of dimethylpolysiloxane crude rubber and this crude rubber was replaced by the vinyl group, the phenyl group or 3 and 3, and 3-truffe RUORO propyl group is illustrated by this. Although a hydroxyl group, an alkoxy group, a methyl group, a vinyl group, and a phenyl group are illustrated as an end group, it is not limited especially.

[0006] The wet method silica of the (B) component used for this invention is the silica impalpable powder of the shape of a particle which removes moisture and a salt and is acquired after reacting mineral acids, such as a hydrochloric acid and a sulfuric acid, to water glass (sodium silicate), and is marketed with trademarks, such as a nip seal, Carplex, TOKUSHIRU, and Hi-SI. Although the loadings are the 5 - 100 weight section to the (A) component 100 weight section, it is 20 - 90 weight section preferably.

[0007] (C) In order to give desirable skid nature, chatter reduction nature, and abrasion resistance to silicone rubber by using together with the wet method silica of the above-mentioned (B) component, the silicious marl of a component is an especially important component, and is a component which makes the feature of this invention. The thing within the limits whose mean particle diameter is 5-40 micrometers is required for this silicious marl. Moreover, the loadings are within the limits of 10 - 50 weight section to the (A) component 100 weight section.

[0008] (D) The parallel cleavage mineral powder of a component carries out the work which is the component used if needed in this invention, and gives desirable skid nature and abrasion resistance to this invention constituent. As parallel cleavage mineral powder, ferro silicate powder and a graphite powder are illustrated. As a ferro silicate, clay system minerals, such as mica system minerals, such as a self-mica, a palagonite, a biotite, and a repi thorite, still PUNOMEREN, a pyrophyllite, talc, a serpentine, \*\*\*\*\*, a play night or a montmorillonite, and an illite, a GUROKO night, etc. are illustrated. (D) a component is in the inclination whose slippery sex in an interface with the glass plate which contacts as the addition is increased improves, therefore it is emitted by friction when silicone rubber is contacted and used for a glass plate -- " -- be in the inclination to cry, for "to decrease and for friction to also decrease (D) Although the addition of a component is made into 0 - 50 weight section to the (A) component 100 weight section, it is 5 - 50 weight section preferably.

[0009] (E) The fluororesin powder of a component is a component which gives lubricity further to the silicone rubber of this invention, and is used if needed. There is polytetrafluoroethylene resin powder etc. as this fluororesin powder. (F) Although the addition of a component is made into 0 - 50 weight section to the (A) component 100 weight section, it is 1 - 10 weight section preferably.

[0010] It is a well-known catalyst from the former used in order that the organic peroxide of the (F) component used for this invention may carry out heat hardening of the silicone rubber constituent, and benzoyl peroxide, t-butyl par benzoate, 2, 4-dichlorobenzoyl peroxide, monochloro benzoyl peroxide, dichloro peroxide, 2, the 5-screw (tert-butyl peroxide) -2, 5-dimethyl hexane, etc. are illustrated by this.

[0011] Although the silicone rubber constituent for wiper blades of this invention is obtained by only blending the (D) component and the (E) component for the above-mentioned (A) component, the (B) component, the (C) component, and the (F) component further if needed The need is accepted. low-molecular-weight organic silicon compounds, such as low polymerization-degree poly dimethylsiloxane of an end hydroxyl-group blockade, a diphenyl silane diol, and a diphenyl methyl silanol, the big low polymerization-degree organopolysiloxane of a vinyl-group content, a pigment, a heat-resistant agent, and the additive of an oilproof agent and others Blending does not interfere. In addition, although there is especially no reason the combination sequence of these (A) - (F) component restricts this Usually, the (A) component and the (B) component are first mixed to scale-loss pressing down using a kneader mixer etc. It is advantageous to use a kneader mixer or 2 rolls for this, to mix the (D) component and the (E) component further the (C) component and if needed, to use 2 rolls and to blend the (F) component finally. Thus, it will harden, if the prepared silicone rubber constituent is heated several for several minutes ] - hour pressurization, or under pressureless at 100 degrees C - 180 degrees C and after cure is carried out further if needed, and it excels in weatherability and abrasion resistance, and the suitable silicone rubber product for a wiper blade without generating of a chatter is given.

[0012]

[Example] Next, an example explains this invention. Among an example, % is percentage by weight and degree of plasticity is a value in 25 degrees C.

[0013]

[Example 1] (A) Dimethylsiloxane methyl vinyl siloxane copolymer crude rubber of the both-ends vinyl-group blockade which has 99.84% of methyl groups, and 0.16% of vinyl groups as a component (degree of plasticity 160), (B) The soil which removes 40 micrometers of mean particle diameters as the wet method silica of specific-surface-area of 240m<sup>2</sup>/g, and a (C) component, and is and meets as a component, (D) As a component, as a mica impalpable powder or a graphite powder, and a (E) component Polytetrafluoroethylene resin powder of 40 micrometers of mean particle diameters, (F) It kneaded with loadings as each component of 50% silicone-oil paste of 2, five dimethyls -2, and five (G tert-butyl peroxide) hexanes is shown in Table 1 as a component, and considered as the silicone rubber constituent. Next, the sheet with a thickness of 2mm was created by stiffening this silicone rubber constituent using a heat press the condition for 170 degrees C and 10 minutes, and performing after cure in oven on 200 more degrees C and the conditions of 4 hours. According to JIS K 6301, a degree of hardness and tensile strength were measured about this sheet. moreover, this silicone rubber constituent -- the fabrication for wiper blades -- heat hardening was carried out under the same conditions as the above using metal mold The obtained mold goods were built into the testing machine for a wiper-blade examination, it pushed against the flat-surface glass plate which wet the silicone rubber mold-goods side with water, and the fluctuation test of 24 hours was performed. Here, fluctuation test conditions were parts for 600g [ of pressing force ], \*\*45 rocking angles, stroke 45cm, and 50 speed/. And while six cc amount of water for /was dropped from a flat-surface glass center section, it was made to rock for 24 hours. These measurement results were shown in Table 1 and Table 2.

[Table 1]

実験番号 組成と特性	本 発 明				比 較 例	
	1	2	3	4	5	6
メチルビニルポリシロキサン生ゴム	70	70	70	70	70	70
湿式シリカ	30	30	30	30	0	30
乾式シリカ	0	0	0	0	30	0
けいそう土	25	0	25	12.5	25	0
マイカ粉末	0	0	0	12.5	0	25.0
黒鉛粉末	0	12.5	0	0	0	0
ポリテトラフルオロエチレン樹脂粉末	0	0	5	5	5	5
有機過酸化物	1	1	1	1	1	1
物理特性						
硬さ	62	63	63	73	71	69
引張強さ (kg/cm <sup>2</sup> )	52	55	56	57	60	67
伸び (%)	268	298	218	221	197	191
引裂き強さ (kg/cm)	15	15	17	21	19	19

[Table 2]

実験番号 項目	本 発 明				比 較 例	
	1	2	3	4	5	6
びびり	24時間に渡ってスムーズに揺動し、びびりの発生はなかった。				初期の数時間はスムーズに揺動するが、以後はびびりの発生が認められた。	
鳴き	鳴きの発生はなかった。				著しく発生した。	反転時に鳴きが発生した。

[0014]

[Effect of the Invention] since the silicone rubber constituent for wiper blades of this invention consists of the (A) component, the (B) component, a (C) component, and a (F) component and the wet silica of the (B) component and the silicious marl of the (C) component are contained especially, if this is applied to a wiper blade -- weatherability -- excelling -- especially -- a "chatter phenomenon" and" -- it has the flume feature it may be featureless to the wiper blade which it cries and "does not generate

[Translation done.]